SEQUENCE LISTING

<110> Lee, Dean Y.
       Park, Kye Won

<120> METHODS AND COMPOSITIONS FOR MANIPULATING THE GUIDED NAVIGATION OF
PHYSIOLOGICAL TRACKING TUBULAR STRUCTURES

<130> 10402/23

<150> 60/392,142
<151> 2002-06-27

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Gln Ile Leu Val His Pro Gln Asp Gln Leu Leu Gln Gly Ser Gly Pro
            35   40   45

Ala Lys Met Arg Cys Arg Ser Ser Gly Gln Pro Pro Thr Ile Arg
        50   55   60

Trp Leu Leu Asn Gly Gln Pro Leu Ser Met Ala Thr Pro Asp Leu His
65   70   75   80

Tyr Leu Leu Pro Asp Gly Thr Leu Leu Leu His Arg Pro Ser Val Gln
                85   90   95

Gly Arg Pro Gln Asp Asp Gln Asn Ile Leu Ser Ala Ile Leu Gly Val
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Tyr Thr Cys Glu Ala Ser Asn Arg Leu Gly Thr Ala Val Ser Arg Gly
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Ala Arg Leu Ser Val Ala Val Leu Gln Glu Asp Phe Gln Ile Gln Pro
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Arg Asp Thr Val Ala Val Val Gly Glu Ser Leu Val Leu Glu Cys Gly
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Lys Pro Leu Val Leu Gln Pro Gly Arg Arg Thr Val Ser Gly Asp Ser
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Leu Met Val Ser Arg Ala Glu Lys Asn Asp Ser Gly Thr Tyr Met Cys
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Val Arg Ile Gln Leu Glu Asn Val Thr Leu Leu Asn Pro Glu Pro Val
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Lys Gly Pro Lys Pro Gly Pro Ser Val Trp Leu Ser Trp Lys Val Ser
            260             265             270

Gly Pro Ala Ala Pro Ala Glu Ser Tyr Thr Ala Leu Phe Arg Thr Gln
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Arg Ser Pro Arg Asp Gln Gly Ser Pro Trp Thr Glu Val Leu Leu Arg
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Gly Leu Gln Ser Ala Lys Leu Gly Gly Leu His Trp Gly Gln Asp Tyr
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Glu Phe Lys Val Arg Pro Ser Ser Gly Arg Ala Arg Gly Pro Asp Ser
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Asn Val Leu Leu Leu Arg Leu Pro Glu Gln Val Pro Ser Ala Pro Pro
            340             345             350

Gln Gly Val Thr Leu Arg Ser Gly Asn Gly Ser Val Phe Val Ser Trp
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Ala Pro Pro Pro Ala Glu Ser His Asn Gly Val Ile Arg Gly Tyr Gln
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Val Trp Ser Leu Gly Asn Ala Ser Leu Pro Ala Ala Asn Trp Thr Val
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Val Gly Glu Gln Thr Gln Leu Glu Ile Ala Thr Arg Leu Pro Gly Ser
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Tyr Cys Val Gln Val Ala Ala Val Thr Gly Ala Gly Ala Gly Glu Leu
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Ser Thr Pro Val Cys Leu Leu Leu Glu Gln Ala Met Glu Gln Ser Ala
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Leu Leu Leu Leu Gly Ile Thr Val Cys Ile Tyr Arg Arg Arg Lys Ala
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Gly Val His Leu Gly Pro Gly Leu Tyr Arg Tyr Thr Ser Glu Asp Ala
            500             505             510


Ile Leu Lys His Arg Met Asp His Ser Asp Ser Pro Trp Leu Ala Asp
        515             520             525


Thr Trp Arg Ser Thr Ser Gly Ser Arg Asp Leu Ser Ser Ser Ser Ser
    530             535             540


Leu Ser Ser Arg Leu Gly Leu Asp Pro Arg Asp Pro Leu Glu Gly Arg
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Arg Ser Leu Ile Ser Trp Asp Pro Arg Ser Pro Gly Val Pro Leu Leu
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Pro Asp Thr Ser Thr Phe Tyr Gly Ser Leu Ile Ala Glu Gln Pro Ser
            580             585             590


Ser Pro Pro Val Arg Pro Ser Pro Lys Thr Pro Ala Ala Arg Arg Phe
    595             600             605


Pro Ser Lys Leu Ala Gly Thr Ser Ser Pro Trp Ala Ser Ser Asp Ser
    610             615             620


Leu Cys Ser Arg Arg Gly Leu Cys Ser Pro Arg Met Ser Leu Thr Pro
625             630             635             640


Thr Glu Ala Trp Lys Ala Lys Lys Lys Gln Glu Leu His Gln Ala Asn
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Ser Ser Pro Leu Leu Arg Gly Ser His Pro Met Glu Ile Trp Ala Trp
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Asn Ser Gly Ser Pro Gly Glu Ala Pro Arg Ala Val Val Ser Trp Arg
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Ala Val Gly Pro Gln Leu His Arg Asn Ser Ser Glu Leu Ala Ser Arg
705             710             715                     720


Pro Leu Pro Pro Thr Pro Leu Ser Leu Arg Gly Ala Ser Ser His Asp
                725             730                 735


Pro Gln Ser Gln Cys Val Glu Lys Leu Gln Ala Pro Ser Ser Asp Pro
            740             745             750


Leu Pro Ala Ala Pro Leu Ser Val Leu Asn Ser Ser Arg Pro Ser Ser
        755             760             765


Pro Gln Ala Ser Phe Leu Ser Cys Pro Ser Pro Ser Ser Ser Asn Leu
    770             775             780


Ser Ser Ser Ser Leu Ser Ser Leu Glu Glu Glu Glu Asp Gln Asp Ser
785             790             795                     800


Val Leu Thr Pro Glu Glu Val Ala Leu Cys Leu Glu Leu Ser Asp Gly
            805             810                 815


Glu Glu Thr Pro Thr Asn Ser Val Ser Pro Met Pro Arg Ala Pro Ser
            820             825             830


Pro Pro Thr Thr Tyr Gly Tyr Ile Ser Ile Pro Thr Cys Ser Gly Leu
        835             840             845


Ala Asp Met Gly Arg Ala Gly Gly Gly Val Gly Ser Glu Val Gly Asn
    850             855             860


Leu Leu Tyr Pro Pro Arg Pro Cys Pro Thr Pro Thr Pro Ser Glu Gly
865             870             875                     880


Ser Leu Ala Asn Gly Trp Gly Ser Ala Ser Glu Asp Asn Val Pro Ser
            885             890             895
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Ala Arg Ala Ser Leu Val Ser Ser Ser Asp Gly Ser Phe Leu Ala Asp
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Thr His Phe Ala Arg Ala Leu Ala Val Ala Val Asp Ser Phe Gly Leu
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Ser Leu Asp Pro Arg Glu Ala Asp Cys Val Phe Thr Asp Ala Ser Ser
        930   935   940

Pro Pro Ser Pro Arg Gly Asp Leu Ser Leu Thr Arg Ser Phe Ser Leu
945   950   955   960

Pro Leu Trp Glu Trp Arg Pro Asp Trp Leu Glu Asp Ala Glu Ile Ser
                965   970   975

His Thr Gln Arg Leu Gly Arg Gly Leu Pro Pro Trp Pro Pro Asp Ser
            980   985   990

Arg Ala Ser Ser Gln Arg Ser Trp Leu Thr Gly Ala Val Pro Lys Ala
            995   1000   1005

Gly Asp Ser Ser
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Gln Ile Leu Val His Pro Gln Asp Gln Leu Phe Gln Gly Pro Gly Pro
        35   40   45

Ala Arg Met Ser Cys Gln Ala Ser Gly Gln Pro Pro Pro Thr Ile Arg
        50   55   60

Trp Leu Leu Asn Gly Gln Pro Leu Ser Met Val Pro Pro Asp Pro His

65   70   75   80

His Leu Leu Pro Asp Gly Thr Leu Leu Leu Gln Pro Pro Ala Arg
                85   90   95

Gly His Ala His Asp Gly Gln Ala Leu Ser Thr Asp Leu Gly Val Tyr
            100   105   110

Thr Cys Glu Ala Ser Asn Arg Leu Gly Thr Ala Val Ser Arg Gly Ala
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Arg Leu Ser Val Ala Val Leu Arg Glu Asp Phe Gln Ile Gln Pro Arg
    130   135   140

Asp Met Val Ala Val Val Gly Glu Gln Phe Thr Leu Glu Cys Gly Pro
145   150   155   160

Pro Trp Gly His Pro Glu Pro Thr Val Ser Trp Trp Lys Asp Gly Lys
            165   170   175

Pro Leu Ala Leu Gln Pro Gly Arg His Thr Val Ser Gly Gly Ser Leu
            180   185   190

Leu Met Ala Arg Ala Glu Lys Ser Asp Glu Gly Thr Tyr Met Cys Val
            195   200   205

Ala Thr Asn Ser Ala Gly His Arg Glu Ser Arg Ala Ala Arg Val Ser
    210   215   220

Ile Gln Glu Pro Gln Asp Tyr Thr Glu Pro Val Glu Leu Leu Ala Val
225   230   235   240

Arg Ile Gln Leu Glu Asn Val Thr Leu Leu Asn Pro Asp Pro Ala Glu
            245   250   255

Gly Pro Lys Pro Arg Pro Ala Val Trp Leu Ser Trp Lys Val Ser Gly
            260   265   270

Pro Ala Ala Pro Ala Gln Ser Tyr Thr Ala Leu Phe Arg Thr Gln Thr
            275   280   285

Ala Pro Gly Gly Gln Gly Ala Pro Trp Ala Glu Glu Leu Leu Ala Gly
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Trp Gln Ser Ala Glu Leu Gly Gly Leu His Trp Gly Gln Asp Tyr Glu
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Phe Lys Val Arg Pro Ser Ser Gly Arg Ala Arg Gly Pro Asp Ser Asn
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Val Leu Leu Leu Arg Leu Pro Glu Lys Val Pro Ser Ala Pro Pro Gln
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Glu Val Thr Leu Lys Pro Gly Asn Gly Thr Val Phe Val Ser Trp Val
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Pro Pro Pro Ala Glu Asn His Asn Gly Ile Ile Arg Gly Tyr Gln Val
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Trp Ser Leu Gly Asn Thr Ser Leu Pro Pro Ala Asn Trp Thr Val Val
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Gly Glu Gln Thr Gln Leu Glu Ile Ala Thr His Met Pro Gly Ser Tyr
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Cys Val Gln Val Ala Ala Val Thr Gly Ala Gly Ala Gly Glu Pro Ser
            420             425             430

Arg Pro Val Cys Leu Leu Leu Glu Gln Ala Met Glu Arg Ala Thr Gln
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Glu Pro Ser Glu His Gly Pro Trp Thr Leu Glu Gln Leu Arg Ala Thr
    450             455             460

Leu Lys Arg Pro Glu Val Ile Ala Thr Cys Gly Val Ala Leu Trp Leu
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Leu Leu Leu Gly Thr Ala Val Cys Ile His Arg Arg Arg Arg Ala Arg
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Val His Leu Gly Pro Gly Leu Tyr Arg Tyr Thr Ser Glu Asp Ala Ile
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Leu Lys His Arg Met Asp His Ser Asp Ser Gln Trp Leu Ala Asp Thr
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Ser Ser Arg Leu Gly Ala Asp Ala Arg Asp Pro Leu Asp Cys Arg Arg
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Ser Leu Leu Ser Trp Asp Ser Arg Ser Pro Gly Val Pro Leu Leu Pro
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Asp Thr Ser Thr Phe Tyr Gly Ser Leu Ile Ala Glu Leu Pro Ser Ser
        580   585   590

Thr Pro Ala Arg Pro Ser Pro Gln Val Pro Ala Val Arg Arg Leu Pro
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Pro Gln Leu Ala Gln Leu Ser Ser Pro Cys Ser Ser Ser Asp Ser Leu
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Cys Ser Arg Arg Gly Leu Ser Ser Pro Arg Leu Ser Leu Ala Pro Ala
625   630   635   640

Glu Ala Trp Lys Ala Lys Lys Lys Gln Glu Leu Gln His Ala Asn Ser
            645   650   655

Ser Pro Leu Leu Arg Gly Ser His Ser Leu Glu Leu Arg Ala Cys Glu
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Leu Gly Asn Arg Gly Ser Lys Asn Leu Ser Gln Ser Pro Gly Ala Val
        675   680   685

Pro Gln Ala Leu Val Ala Trp Arg Ala Leu Gly Pro Lys Leu Leu Ser
    690   695   700

Ser Ser Asn Glu Leu Val Thr Arg His Leu Pro Pro Ala Pro Leu Phe
705   710   715   720

Pro His Glu Thr Pro Pro Thr Gln Ser Gln Gln Thr Gln Pro Pro Val
            725   730   735

Ala Pro Gln Ala Pro Ser Ser Ile Leu Leu Pro Ala Ala Pro Ile Pro
            740   745   750

```
Ile Leu Ser Pro Cys Ser Pro Pro Ser Pro Gln Ala Ser Ser Leu Ser
        755             760         765

Gly Pro Ser Pro Ala Ser Ser Arg Leu Ser Ser Ser Ser Leu Ser Ser
        770             775         780

Leu Gly Glu Asp Gln Asp Ser Val Leu Thr Pro Glu Glu Val Ala Leu
785             790             795             800

Cys Leu Glu Leu Ser Glu Gly Glu Glu Thr Pro Arg Asn Ser Val Ser
                805             810             815

Pro Met Pro Arg Ala Pro Ser Pro Pro Thr Thr Tyr Gly Tyr Ile Ser
            820             825             830

Val Pro Thr Ala Ser Glu Phe Thr Asp Met Gly Arg Thr Gly Gly Gly
        835             840             845

Val Gly Pro Lys Gly Gly Val Leu Leu Cys Pro Pro Arg Pro Cys Leu
    850             855             860

Thr Pro Thr Pro Ser Glu Gly Ser Leu Ala Asn Gly Trp Gly Ser Ala
865             870             875             880

Ser Glu Asp Asn Ala Ala Ser Ala Arg Ala Ser Leu Val Ser Ser Ser
            885             890             895

Asp Gly Ser Phe Leu Ala Asp Ala His Phe Ala Arg Ala Leu Ala Val
            900             905             910

Ala Val Asp Ser Phe Gly Phe Gly Leu Glu Pro Arg Glu Ala Asp Cys
    915             920             925

Val Phe Ile Asp Ala Ser Ser Pro Pro Ser Pro Arg Asp Glu Ile Phe
    930             935             940

Leu Thr Pro Asn Leu Ser Leu Pro Leu Trp Glu Trp Arg Pro Asp Trp
945             950             955             960

Leu Glu Asp Met Glu Val Ser His Thr Gln Arg Leu Gly Arg Gly Met
            965             970             975

Pro Pro Trp Pro Pro Asp Ser Gln Ile Ser Ser Gln Arg Ser Gln Leu
```

                    980   985   990

His Cys Arg Met Pro Lys Ala Gly Ala Ser Pro Val Asp Tyr Ser
          995   1000   1005

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<212>   PRT
<213>   Mouse

<400>   5

Met Gly Ser Gly Gly Thr Gly Leu Leu Gly Thr Glu Trp Pro Leu Pro
1   5   10   15

Leu Leu Leu Leu Phe Ile Met Gly Gly Glu Ala Leu Asp Ser Pro Pro
          20   25   30

Gln Ile Leu Val His Pro Gln Asp Gln Leu Leu Gln Gly Ser Gly Pro
          35   40   45

Ala Lys Met Arg Cys Arg Ser Ser Gly Gln Pro Pro Pro Thr Ile Arg
      50   55   60

Trp Leu Leu Asn Gly Gln Pro Leu Ser Met Ala Thr Pro Asp Leu His
65   70   75   80

Tyr Leu Leu Pro Asp Gly Thr Leu Leu Leu His Arg Pro Ser Val Gln
              85   90   95

Gly Arg Pro Gln Asp Asp Gln Asn Ile Leu Ser Ala Ile Leu Gly Val
          100   105   110

Tyr Thr Cys Glu Ala Ser Asn Arg Leu Gly Thr Ala Val Ser Arg Gly
          115   120   125

Ala Arg Leu Ser Val Ala Val Leu Gln Glu Asp Phe Gln Ile Gln Pro
      130   135   140

Arg Asp Thr Val Ala Val Val Gly Glu Ser Leu Val Leu Glu Cys Gly
145   150   155   160

Pro Pro Trp Gly Tyr Pro Lys Pro Ser Val Ser Trp Trp Lys Asp Gly
              165   170   175

Lys Pro Leu Val Leu Gln Pro Gly Arg Arg Thr Val Ser Gly Asp Ser
            180   185   190

Leu Met Val Ser Arg Ala Glu Lys Asn Asp Ser Gly Thr Tyr Met Cys
        195   200   205

Met Ala Thr Asn Asn Ala Gly Gln Arg Glu Ser Arg Ala Ala Arg Val
    210   215   220

Ser Ile Gln Glu Ser Gln Asp His Lys Glu His Leu Glu Leu Leu Ala
225   230   235   240

Val Arg Ile Gln Leu Glu Asn Val Thr Leu Leu Asn Pro Glu Pro Val
            245   250   255

Lys Gly Pro Lys Pro Gly Pro Ser Val Trp Leu Ser Trp Lys Val Ser
            260   265   270

Gly Pro Ala Ala Pro Ala Glu Ser Tyr Thr Ala Leu Phe Arg Thr Gln
        275   280   285

Arg Ser Pro Arg Asp Gln Gly Ser Pro Trp Thr Glu Val Leu Leu Arg
    290   295   300

Gly Leu Gln Ser Ala Lys Leu Gly Gly Leu His Trp Gly Gln Asp Tyr
305   310   315   320

Glu Phe Lys Val Arg Pro Ser Ser Gly Arg Ala Arg Gly Pro Asp Ser
            325   330   335

Asn Val Leu Leu Leu Arg Leu Pro Glu Gln Val Pro Ser Ala Pro Pro
        340   345   350

Gln Gly Val Thr Leu Arg Ser Gly Asn Gly Ser Val Phe Val Ser Trp
        355   360   365

Ala Pro Pro Pro Ala Glu Ser His Asn Gly Val Ile Arg Gly Tyr Gln
    370   375   380

Val Trp Ser Leu Gly Asn Ala Ser Leu Pro Ala Ala Asn Trp Thr Val
385   390   395   400

```
Val Gly Glu Gln Thr Gln Leu Glu Ile Ala Thr Arg Leu Pro Gly Ser
            405                 410                 415


Tyr Cys Val Gln Val Ala Ala Val Thr Gly Ala Gly Ala Gly Glu Leu
            420                 425                 430


Ser Thr Pro Val Cys Leu Leu Leu Glu Gln Ala Met Glu Gln Ser Ala
            435                 440                 445


Arg Asp Pro Arg Lys His Val Pro Trp Thr Leu Glu Gln Leu Arg Ala
    450                 455                 460


Thr Leu Arg Arg Pro Glu
465                 470
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<210> 6
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<212> PRT
<213> Homo sapiens

<400> 6

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Met Gly Ser Gly Gly Asp Ser Leu Leu Gly Gly Arg Gly Ser Leu Pro
1               5                   10                  15


Leu Leu Leu Leu Leu Ile Met Gly Gly Met Ala Gln Asp Ser Pro Pro
                20                  25                  30


Gln Ile Leu Val His Pro Gln Asp Gln Leu Phe Gln Gly Pro Gly Pro
            35                  40                  45


Ala Arg Met Ser Cys Gln Ala Ser Gly Gln Pro Pro Pro Thr Ile Arg
    50                  55                  60


Trp Leu Leu Asn Gly Gln Pro Leu Ser Met Val Pro Pro Asp Pro His
65                  70                  75                  80


His Leu Leu Pro Asp Gly Thr Leu Leu Leu Leu Gln Pro Pro Ala Arg
                85                  90                  95


Gly His Ala His Asp Gly Gln Ala Leu Ser Thr Asp Leu Gly Val Tyr
            100                 105                 110


Thr Cys Glu Ala Ser Asn Arg Leu Gly Thr Ala Val Ser Arg Gly Ala
            115                 120                 125
```

```
Arg Leu Ser Val Ala Val Leu Arg Glu Asp Phe Gln Ile Gln Pro Arg
    130             135             140

Asp Met Val Ala Val Val Gly Glu Gln Phe Thr Leu Glu Cys Gly Pro
145             150             155             160

Pro Trp Gly His Pro Glu Pro Thr Val Ser Trp Trp Lys Asp Gly Lys
            165             170             175

Pro Leu Ala Leu Gln Pro Gly Arg His Thr Val Ser Gly Gly Ser Leu
            180             185             190

Leu Met Ala Arg Ala Glu Lys Ser Asp Glu Gly Thr Tyr Met Cys Val
    195             200             205

Ala Thr Asn Ser Ala Gly His Arg Glu Ser Arg Ala Ala Arg Val Ser
    210             215             220

Ile Gln Glu Pro Gln Asp Tyr Thr Glu Pro Val Glu Leu Leu Ala Val
225             230             235             240

Arg Ile Gln Leu Glu Asn Val Thr Leu Leu Asn Pro Asp Pro Ala Glu
            245             250             255

Gly Pro Lys Pro Arg Pro Ala Val Trp Leu Ser Trp Lys Val Ser Gly
            260             265             270

Pro Ala Ala Pro Ala Gln Ser Tyr Thr Ala Leu Phe Arg Thr Gln Thr
    275             280             285

Ala Pro Gly Gly Gln Gly Ala Pro Trp Ala Glu Glu Leu Leu Ala Gly
    290             295             300

Trp Gln Ser Ala Glu Leu Gly Gly Leu His Trp Gly Gln Asp Tyr Glu
305             310             315             320

Phe Lys Val Arg Pro Ser Ser Gly Arg Ala Arg Gly Pro Asp Ser Asn
            325             330             335

Val Leu Leu Leu Arg Leu Pro Glu Lys Val Pro Ser Ala Pro Pro Gln
            340             345             350
```

```
Glu Val Thr Leu Lys Pro Gly Asn Gly Thr Val Phe Val Ser Trp Val
    355             360             365

Pro Pro Pro Ala Glu Asn His Asn Gly Ile Ile Arg Gly Tyr Gln Val
    370             375             380

Trp Ser Leu Gly Asn Thr Ser Leu Pro Pro Ala Asn Trp Thr Val Val
385             390             395             400

Gly Glu Gln Thr Gln Leu Glu Ile Ala Thr His Met Pro Gly Ser Tyr
            405             410             415

Cys Val Gln Val Ala Ala Val Thr Gly Ala Gly Ala Gly Glu Pro Ser
            420             425             430

Arg Pro Val Cys Leu Leu Leu Glu Gln Ala Met Glu Arg Ala Thr Gln
    435             440             445

Glu Pro Ser Glu His Gly Pro Trp Thr Leu Glu Gln Leu Arg Ala Thr
    450             455             460

Leu Lys Arg Pro Glu
465
```